

## CLAIMS

1. A method of communicating between an external control system and an electronic ballast comprising:
  - receiving an external signal from the external control system 410;
  - generating an outboard signal in response to the external signal 412;
  - transmitting the outboard signal across a transformer to generate an inboard signal 414;
  - generating an internal signal in response to the inboard signal 416; and
  - utilizing the internal signal in a microprocessor 418.
2. The method of claim 1 wherein the generating an outboard signal in response to the external signal comprises shorting across a secondary winding of the transformer.
3. The method of claim 1 wherein the generating an internal signal in response to the inboard signal comprises:
  - monitoring the inboard signal on a primary winding of the transformer; and
  - squaring up the inboard signal.
4. The method of claim 1 further comprising:
  - receiving a second internal signal from the microprocessor 420;
  - generating a second inboard signal in response to the second internal signal 422;
  - transmitting the second inboard signal across the transformer to generate a second outboard signal 424;
  - generating a second external signal in response to the second outboard signal 426; and
  - transmitting the second external signal to the external control system 428.
5. The method of claim 4 wherein the second internal signal has a higher duty cycle and a lower duty cycle, and the generating a second inboard signal in response to the second internal signal comprises toggling the second internal signal between the higher duty cycle and the lower duty cycle at a primary winding of the transformer.
6. The method of claim 5 wherein the second outboard signal has a higher voltage corresponding to the higher duty cycle and a lower voltage corresponding to the lower duty cycle.

7. The method of claim 6 wherein the generating a second external signal in response to the second outboard signal comprises shorting across a connection to the external control system in response to the higher voltage.
8. A system communicating between an external control system and an electronic ballast comprising:  
means for receiving an external signal from the external control system;  
means for generating an outboard signal in response to the external signal;  
means for transmitting the outboard signal across a transformer to generate an inboard signal;  
means for generating an internal signal in response to the inboard signal; and  
means for utilizing the internal signal in a microprocessor.
9. The system of claim 8 wherein the means for generating an outboard signal in response to the external signal comprises means for shorting across a secondary winding of the transformer.
10. The system of claim 8 wherein the means for generating an internal signal in response to the inboard signal comprises:  
means for monitoring the inboard signal on a primary winding of the transformer; and  
means for squaring up the inboard signal.
11. The system of claim 8 further comprising:  
means for receiving a second internal signal from the microprocessor;  
means for generating a second inboard signal in response to the second internal signal;  
means for transmitting the second inboard signal across the transformer to generate a second outboard signal;  
means for generating a second external signal in response to the second outboard signal; and  
means for transmitting the second external signal to the external control system.
12. The system of claim 11 wherein the second internal signal has a higher duty cycle and a lower duty cycle, and the means for generating a second inboard signal in response to the second internal signal comprises means for toggling the second internal signal between the higher duty cycle and the lower duty cycle at a primary winding of the transformer.

13. The system of claim 12 wherein the second outboard signal has a higher voltage corresponding to the higher duty cycle and a lower voltage corresponding to the lower duty cycle.

14. The system of claim 13 wherein the means for generating a second external signal in response to the second outboard signal comprises means for shorting across a connection to the external control system in response to the higher voltage.

15. An electronic ballast with transformer interface communicating between an external control system and the electronic ballast comprising:

an outboard circuit 160, the outboard circuit 160 being operably connected to the external control system and communicating with the external control system by an external signal 140;

a transformer 162, the transformer 162 being operably connected to the outboard circuit 160 and communicating with the outboard circuit 160 by an outboard signal 166; and

an inboard circuit 164, the inboard circuit 164 being operably connected to the transformer 162, communicating with the transformer 162 by an inboard signal 168, and communicating with a microprocessor 128 by an internal signal 150.

16. The circuit of claim 15 wherein:

the transformer 162 comprises a primary winding and a secondary winding;

the inboard signal 168 has a lower duty cycle and a higher duty cycle;

the lower duty cycle on the primary winding generates a lower voltage for the outboard signal 166 on the secondary winding; and

the higher duty cycle on the primary winding generates a higher voltage for the outboard signal 166 on the secondary winding.

17. The circuit of claim 15 wherein the external signal 140 follows the Digital Addressable Lighting Interface (DALI) protocol.

18. The circuit of claim 15 wherein the outboard circuit 160 comprises:  
a send circuit 330 providing the external signal 140 to the external control system; and  
a receive circuit 332 receiving the external signal 140 from the external control system.
19. The circuit of claim 18 wherein the outboard signal 166 has a first state and a second state, and the send circuit 330 is responsive to the outboard signal 166 to short a connection to the external control system when the outboard signal 166 is in the first state.
20. The circuit of claim 18 wherein external signal 140 has a first state and a second state, and the receive circuit 332 is responsive to the external signal 140 to short a secondary winding of the transformer 162 when the external signal 140 is in the first state.
21. The circuit of claim 18 wherein the outboard circuit 160 further comprises:  
a bridge D13 operably connected to communicate the external signal 140 with the send circuit 330; and  
a rectifier/filter 334 operably connected to communicate the outboard signal 166 with the receive circuit 332.
22. The circuit of claim 15 wherein the inboard circuit 164 comprises:  
a comparator 336 providing the internal signal 150 to the microprocessor 128; and  
an outgoing switch 338 receiving the internal signal 150 from the microprocessor 128.